

## 2019 Academic Alliance Lightning Talks

### Diversity through Holistic Admissions

Raven Avery, ravena@cs.uw.edu, The Allen School, University of Washington, Seattle

**Data sources:** Essay, short answers, work history, grade summary, and transcript.

#### Guiding principles:

- All admitted students should have both good academic preparation and good non-academic qualities. We seek to admit students with (1) the potential to do well here, (2) benefit from our program, (3) contribute to CS at UW, and (4) use CS skills productively in the future.
- We're not tallying past grades, or skimming for reasons to deny.
- We evaluate potential holistically. We admit different people for different reasons. We don't need hundreds of identical students with the matching transcripts and resumes.
- Diversity (defined broadly!) in our program is crucial for our industry and our educational goals.

#### Holistic Admission Criteria:

##### Ability to do the work:

- Ability to work outside of comfort zone
- Evidence of motivation and work-ethic
- Long-term commitment to activities
- Utilizes resources and supports
- Responsible planning

##### Ability to contribute in teams:

- Group work/project experience
- Actively engaged in some community
- Leadership experience
- Takes initiative
- Ethical behavior and good judgement

##### Ability to contribute valuable perspective:

- Interest in a variety of activities
- Passion for something greater
- Unique personal or professional background
- Interdisciplinary academic interests
- Unique career goals
- Creativity
- Stands up for their beliefs

##### Ability to persist through challenges:

- Self-advocacy
- Resilience and persistence
- Problem-solving skills
- Utilizes resources
- Tries hard things

#### Discussion Questions:

1. How might a holistic admissions process help redirect students' attention from grades?
2. Why might women be less likely to have taken a CS class in high school?
3. How would you explain to a colleague that a student without HS CS experience still "deserves" to be able to major in CS?
4. What overlap is there between the criteria for a successful student at UW and your institution?
5. Why might valuing work experience, family commitments, and volunteer experience together be important?

## Gender-balanced TAs from an Unbalanced Student Body

Amir Kamil, akamil@umich.edu, EECS Department, University of Michigan

Read the paper: <http://web.eecs.umich.edu/~akamil/papers/sigcse19.pdf>

**Guiding Principles:** Evaluate TA applicants based upon their teaching skills and plans for creating an inclusive classroom. TAs aren't hired *because* of their gender identity - they are hired because they have the relevant skills. Role models are important, but a woman who is a *bad* TA isn't a very good role model. The skill of potential TAs are evaluated in two rounds:

**Round 1: TA Application Requirements:** (1) Background - year, major, GPA. (2) Free-response explanations for why they would like to TA and previous teaching experience. (3) A 5-minute video covering any course topic with any style (e.g., a sample lesson, a mock office-hours, exam review, etc.).

### Round 2: In-person Interview Questions:

- What have you learned from your teaching/tutoring experience and what can you improve?
- For the course you want to TA, what could be improved from when you took it?
- What do you think we can do to improve the climate for women in CS at UM?
- Please teach me [Topic X] as if I were a student.
  - Applicants are able to prepare for this and are told it is to demonstrate their teaching style not their content knowledge.
  - Teaching demonstrations are then rated on (a) clarity, (b) technical proficiency, (c) whiteboard use, and (d) responsiveness to students' questions.

### Discussion Questions:

1. What could you do to encourage more women to apply to be TAs?

2. UM *does not* consider GPA or grade in deciding who to interview and found that GPA is not predictive of success as a TA.

a) Why might a student's grade in a course not be representative of what they learned?

b) What opportunities does a TA have to improve their understanding of the course material?

c) Why might students *prefer* a TA who found the course challenging?

3. Your colleague hears that you want to encourage more women to apply to be TAs and that "GPA is not predictive of success." Can you imagine them incorrectly inferring that you believe women are less good at CS or get lower grades? Why might it be important to explicitly contradict this interpretation?

## Case Study: Retention in CSE @ UCSD

Christine Alvarado, cjalvarado@eng.ucsd.edu, CSE Department, University of California, San Diego

Read the report written by the ACM Education Board Retention Committee.

Retention in Computer Science Undergraduate Programs in the U.S  
Data Challenges and Promising Interventions

[www.acm.org/binaries/content/assets/education/retention-in-cs-undergrad-programs-in-the-us.pdf](http://www.acm.org/binaries/content/assets/education/retention-in-cs-undergrad-programs-in-the-us.pdf)

**Discussion Questions:**

1. The ACM report encourages data collection that is
  - regularly analyzed,
  - disaggregated by gender and race, and
  - used to drive continual improvements.
  - a) What specific data would be useful for you to collect at your institution? Why?
  
2. The ACM report argues that “Institutions should provide programs, services, and pathways that enable students entering the institution with varying computational backgrounds to succeed in their intended major (especially with regard to computing and mathematics).”
  - a) What different backgrounds might cause challenges for students at your institution? What data would allow you to investigate your hypotheses?
  
3. Since July of 2017 the Computer Science and Engineering (CSE) department at the University of California, San Diego has been holding a lottery to admit qualified students rather than a competition for the highest grades.  
[cse.ucsd.edu/sites/cse.ucsd.edu/files/undergraduate/NewMajorAdmissionsPolicyRationale.pdf](http://cse.ucsd.edu/sites/cse.ucsd.edu/files/undergraduate/NewMajorAdmissionsPolicyRationale.pdf)
  - a) How might a lottery address differences in students’ access to CS prior to college?
  
  - b) What challenges might you face at your institution in implementing a lottery?
  
4. The ACM report argues that “Institutions should not wait for more research before launching new interventions and using new insights to continuously refine and improve these interventions.”
  - a) What initiative might you implement now, and how would you collect data to investigate its effect?

**EngageCSEdu: What You Need to Know**

Briana Morrison, [bbmorrison@unomaha.edu](mailto:bbmorrison@unomaha.edu), CS Department, University of Nebraska Omaha

<https://www.engage-csedu.org>

EngageCSEdu has:

- **Instructional Materials:** faculty-contributed, peer-reviewed introductory CS course materials.
- **Engagement Practices:** a framework of research-based teaching practices that support diversity.
- **Community:** faculty committed to broadening participation in computing through great pedagogy



## Engagement Practices

[www.ncwit.org/EngageCSEduPoster](http://www.ncwit.org/EngageCSEduPoster)

Principle 1: Grow a positive student community:

- Create welcoming physical spaces.
- Encourage professional behavior.
- Discourage gender, racial, and other social stereotypes.
- Employ well-structured collaborative learning.
- Group students by level of experience in computing.

Principle 2: Make it matter:

- Use material that is relevant and meaningful to students' lives.
- Make explicit connections to other disciplines.
- Address misconceptions about the field of computing.
- Allow students to pursue their own interests when possible.

Principle 3: Build student confidence and professional identity:

- Promote a "growth mindset."
- Provide feedback that helps students improve their performance.
- Create opportunities for students to interact with faculty inside and outside the classroom.
- Mitigate stereotype threat by avoiding stereotypes and providing positive role models.

## What can you do now?

- Tell your colleagues!
- Search for resources!
- Become a reviewer!
- Submit your intro course materials!
- Make peer-reviewed assignments on [engage-csedu.org](http://engage-csedu.org) count for promotion and tenure of teaching faculty at your institution!

## Discussion Questions:

1. How might the Engagement Practices help broaden participation in your institution's computing program?
2. Which Engagement Practice is your institution doing the best at? Which Engagement Practice do you most need to work on? Why?
3. What Engagement Practice could you most easily integrate into a homework assignment?
4. How could you advocate for Engage CS Edu submissions counting towards promotion and tenure?

# Developing an Intensive Research Experience for Undergraduate Women

Katie A. Siek, Informatics, Indiana University, [ksiek@indiana.edu](mailto:ksiek@indiana.edu)

Checkout the site: [helloresearch.sice.indiana.edu/](http://helloresearch.sice.indiana.edu/)

Read the paper: [http://bit.ly/HelloResearchSIGCSE2019](http://bit.ly>HelloResearchSIGCSE2019)

## Discussion Questions:

1. Why might an Intensive Research Experience (IRE) be helpful for interesting women in graduate school?
  
2. Undergraduate research opportunities increase retention - especially in underrepresented groups. Undergraduate research also requires significant hands-on teaching and assistance.
  - a) How can we create incentives for faculty to consider undergraduate research?
  
  - b) What best practices can be followed to give faculty credit for undertaking undergraduate research?
  
3. In computing, faculty sometimes say that they cannot teach undergraduates how to do research in their area because it is too technical/theoretical/complicated.
  - a) How can we work with faculty to understand what parts of their research can be identified for undergraduate research?
  
  - b) How can we help faculty reflect on their research process so that it is not an all or nothing approach?
  
4. UW Seattle hosted OurCS@UW+AccessComputing, a two-day research-focused workshop for undergraduate women with disabilities. What focus could you have if you hosted an OurCS-style event at your institution?

This year Google offered grants of \$16,000 to provide an Intensive Research Experience (IRE) to at least 32 undergraduate women. The deadline for proposals this year was May 6, 2019, but you can contact [e-csr@google.com](mailto:e-csr@google.com) to be notified of future requests for proposals.



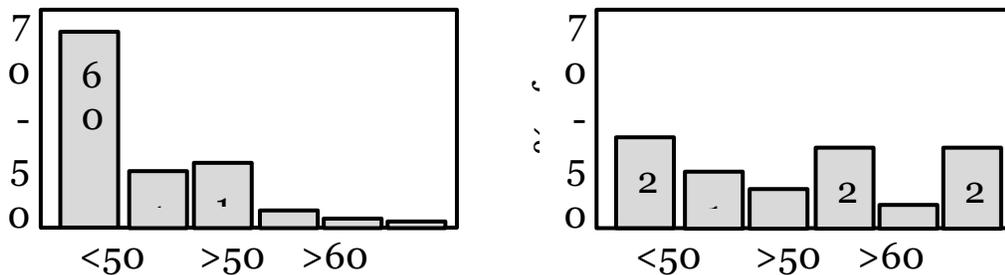
## Process Oriented Guided Inquiry Learning

Clif Kussmaul, [clif@kussmaul.org](mailto:clif@kussmaul.org), Green Mango Associates, LLC  
 Olga Glebova, [oglebova1@gsu.edu](mailto:oglebova1@gsu.edu), CS Department, Georgia State University

- <http://pogil.org>      **The POGIL Project** (overview, background, workshops)
- <http://cspogil.org>      **The CS-POGIL Project** (activities across the CS curriculum)
- <http://introcspogil.org>      **The IntroCS POGIL Project** (seeking faculty participants)

Here is a sample POGIL mini-activity based on published data about a POGIL course.  
 Shaded text is for sample answers and labels for explore-invent-apply stages.

**Research Study on POGIL:** Suzanne Ruder and Sally Hunnicutt (in Moog & Spencer, eds, *Process-Oriented Guided Inquiry Learning*, 2008) studied how POGIL affects student learning. On the first day of *Organic II*, students took a surprise pre-quiz on content from *Organic I*, where some students had a **lecture** course, and others had a **POGIL** course.



Explore: 1. In the bar graphs above, what percentage of students:

a.	from the <b>lecture</b> course scored <50?	60%
b.	from the <b>POGIL</b> course scored <50?	25%
c.	from the <b>lecture</b> course passed the quiz (70 or better)?	$5+2+0 = 7\%$
d.	from the <b>POGIL</b> course passed the quiz (70 or better)?	$2+5+2 = 9\%$

### Discussion Questions:

Invent: 2. What do these results suggest about traditional and POGIL classes?

Invent: 3. ? (key idea) POGIL classes tend to spend **more time** on **fewer concepts**, and some students and teachers worry about the concepts they miss. Explain whether or not these concerns are supported by the data.

Apply: 4. ? (optional)

- What **other factors** might affect the results shown above for the two courses?
- How might POGIL-style activities affect sense of community and belonging, particularly for female students?